

The JOBS Act, Audit Quality, and IPO Underpricing.

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Abstract

I examine the effect of audit quality on the underpricing of initial public offerings (IPOs) using a sample of IPOs filing as an Emerging Growth Company (EGC) as specified by the JOBS act. Given the exemptions provided by the JOBS act for EGCs, and the resulting increased information asymmetry leading to increased underpricing, this study examines the contributing factors of audit quality to the underpricing phenomenon. I argue that audit quality, measured by audit deficiencies as per PCAOB firm level inspection reports, the ratio of audit fees to total fees, the issuance of a going concern opinion, and employing an industry specialist auditor, decreases information asymmetry, thereby reducing IPO underpricing. Using a sample of 212 IPOs, I do not find evidence that a variety of measures for audit quality play a mitigating role in the underpricing of IPOs. This implies that audit quality does not influence the higher levels of underpricing EGC firms experience. The results hold when firms voluntarily disclose ICWs and avail of the provision allowing them to delay compliance with changes in accounting regulation.

Keywords: Underpricing, IPO, Audit Quality, SOX 404, JOBS Act, Emerging Growth Companies, Information Asymmetry.

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1. Introduction

After a period of considerably fewer Initial Public Offerings (IPOs), the Jumpstart Our Business Startups (JOBS) Act¹ was enacted in 2012, significantly impacting US capital markets. The main purpose of the JOBS Act is to make capital markets more accessible to smaller companies, the so-called Emerging Growth Companies (EGCs) (JOBS Act, 2012). A large focus of the JOBS Act is on the reduction of disclosure requirements for EGC IPOs in order to reduce costs and thus increase accessibility, thereby intending to increase the number of IPOs.

In the United States, companies that wish to raise capital by going public through an IPO are subject to a lengthy IPO process. This process ranges from working with an underwriter, to creating demand and establishing the offering price, to the actual application with the Securities Exchange Commission (SEC) including the audited financial statements (Daily, Certo, Dalton & Roengpitya; 2003). Companies qualifying for EGC status may make use of a variety of provisions alleviating some of these burdens. These include, among other, a reduction in the number of years of presented financial information and audited financial reports, a partial exemption from rules mandating disclosure on executive compensation, delayed compliance with new accounting rules, and an exemption from Sarbanes-Oxley Act (SOX) section 404 on internal control (IC) reporting (JOBS Act, 2012).

Prior research on the consequences of the JOBS Act finds that the number of IPOs have indeed increased since the enactment of the JOBS Act. Dambra, Field and Gustafson (2015) find an increase of 25%, especially driven by an increase in IPOs in considerably riskier industries. The intended effect of reducing the costs for smaller issuers, on the other hand, is however debatable, shown by the inconclusive results of prior research (Chaplinsky, Hanley & Moon, 2017; Westfall & Omer, 2018). An unintended negative consequence of the JOBS Act can be seen in the increased underpricing EGC IPOs experience compared to non-EGC IPOs (Barth, Landsman and Taylor, 2017). All in all, the effectiveness of the JOBS Act in achieving the intended results is questionable. This research adds to the stream of literature on the JOBS Act and IPO underpricing by offering a different approach to the effects of the JOBS Act.

Extant literature argues two explanatory theories for the underpricing phenomenon. First, information asymmetry regarding the true value of the IPO shares that exists between informed and uninformed investors, resulting in a reduction of the maximum spending willingness of uninformed investors. To nonetheless attract the uninformed investors, IPO firms reduce their price below the actual worth to meet the new price equilibrium among investors (Rock, 1986).

¹ Jumpstart Our Business Startups Act, 15 U.S.C. § 3606 (2012).

Second, the litigation-risk hypothesis argues that IPOs are inherently riskier investments and are therefore more likely to be subject to litigation. To mitigate this exposure to litigation risk, underpricing reduces the potential damages that may be obtained by the accuser and thus reduces the likelihood of being subject to litigation (Lowry & Shu, 2002).

I argue that audit quality is a mitigating factor to both theories contributing to the underpricing phenomenon. Auditors lend credibility to financial statements as they provide assurance to the users of these financial statements (DeFond & Zhang, 2014). This is of special importance in the IPO context as typically little information is known about an IPO-prospect (Weber & Willenborg, 2003). Within the context of the JOBS Act, the reduced disclosure requirements result in a further reduction of the information available to all investors. The information gap between informed investors using private information and uninformed investors without this additional information is therefore argued to be larger than for non-EGC firms. The quality of the little information that is presented is therefore expected to significantly influence this information gap. In addition, prior research shows that in a setting in which audit quality decreases because of a change in regulation, underpricing increases to insure against higher litigation risk (Muzatko, Johnstone, Mayhew & Rittenberg, 2004). I therefore argue that as audit quality increases, the underpricing of IPOs of EGC firms decreases. Audit quality is therefore hypothesized to have a mitigating effect on underpricing.

To test the hypothesized effect, I construct a sample of 212 EGC IPOs issued between 2016 and 2019. I adopt the suggested approach by DeFond and Zhang (2014) and include a total of four different measures for audit quality that proxy for audit quality from an input as well as output perspective: audit deficiencies as per PCAOB firm level inspection reports, the ratio of audit fees to total fees, the issuance of a going concern opinion prior to the IPO, and an indicator variable for employing an industry specialist auditor. In addition, I investigate two additional relations between JOBS Act provisions as well as their interaction effects with audit quality on the level of underpricing of EGC IPOs. First, I examine the effect of the provision allowing EGC firms to delay compliance with changes in accounting regulation on underpricing. EGC firms opting out of this provision do so irrevocably. Second, EGC firms are exempt from having an auditor's report on internal controls. I therefore examine the effect of the voluntary disclosure of internal control weaknesses (ICWs) on underpricing.

I find no evidence that the four measures of audit quality significantly influence IPO underpricing. These results hold for the model including the delayed compliance and voluntary ICW disclosure. An additional analysis consisting only of accelerated filers, who would otherwise have to comply with SOX section 404 (b) requiring an auditor report on IC, yields

similar results. These results indicate that audit quality is not a mitigating factor regarding the greater information asymmetry as well as the consequent underpricing EGC IPOs are subject to. Given the increased underpricing that EGC IPOs are subject to, the results suggest that there are other unexplored factors that influence the level of underpricing of EGC IPOs.

This study contributes to prior research on the JOBS Act, on IPO underpricing, and on audit quality. The results suggest that audit quality does not have a mitigating effect on the uncertainty that exists due to information asymmetry. More specifically, the hypothesized greater *ex ante* uncertainty of EGC IPOs is not influenced by the audit quality of issued IPO documents. For lawmakers and market participants, the results suggest that there are other factors underlying the greater levels of underpricing EGC firms are subject to compared to non-EGC firms.

In contrast to the current literature on the JOBS Act, I consider a variety of input and output audit quality indicators, thereby carrying out a thorough analysis on the effect of audit quality on IPO underpricing. Moreover, in contrast to prior JOBS Act research, I consider a more recent time period. My results on the effect of audit quality on the underpricing phenomenon in the JOBS Act context are in line with prior research. The results therefore contribute to the reliability of the existing evidence regarding the effect of audit quality on the underpricing of EGC IPOs.

This study is also subject to various caveats which reveal areas for future research. First, as financial reporting quality is the product of the quality of the financial statements before the audit in combination with the value added through audit quality, it is inherently difficult to measure the isolated effect of audit quality. My research might not properly control for the quality of the pre-audited financial statements, or the audit quality proxies used might not properly measure the concept of audit quality. The research is therefore likely to be subject to internal validity concerns. Second, this study might also be subject to endogeneity concerns. Given the complex nature of the to be measured concept, it is not unlikely that the models suffer from omitted correlated variables. If influential variables are missing in the regression models, this likely distorts the coefficient estimates, leading to biased results.

The remainder of this paper is arranged as follows. Section 2 reflects on the JOBS Act and provides a theoretical background on the IPO process and audit quality building up to the hypothesis development. Section 3 describes the measurements of audit quality used, the sample and research design. Section 4 presents the descriptive statistics, results and the additional analysis. To conclude, section 5 provides closing remarks, limitations and potential areas for future research.

2. Theoretical Background and Hypothesis Development

This paper sheds light on the joint consequences of the JOBS Act and the accounting landscape on the IPO process. In this section, I will reflect on the provisions of the JOBS Act and provide a general overview of the IPO process. Moreover, I will discuss previous literature on IPO underpricing and audit quality, which then builds up to the hypothesis development.

2.1 The Adoption of the JOBS Act

Since the adoption of the Securities Act of 1933, US Capital markets have been subject to increased regulation and monitoring. After a period of large accounting scandals in the 1990s and early 2000s, regulation was significantly tightened with the SEC adopting one of the most rigorous legislative measures to date, the Sarbanes-Oxley Act (SOX) (Hall, 2003; Hoag, Myring & Schroeder, 2017; Knechel, 2015). SOX was adopted with the intention of restoring trust in the financial markets, in part by implementing a variety of measures leading to improved financial reporting and audit quality, such as the prohibition of auditors providing certain non-auditing services (Hoag et al., 2017; Knechel, 2015; SEC, 2003; SOX, 2002).

Prior research reflecting on the effects of SOX on audit quality indicate that audit quality has improved compared to the pre-SOX period (DeFond & Lennox, 2011; Kim, Dandu & Iren, 2019). In spite of the improved audit quality, critics note that the implementation has also led to adverse effects (Coates, 2007; Knechel, 2016). Knechel (2016) states that in the auditing market there is a tradeoff between audit quality and accounting fees. As audit quality increased due to SOX, accounting fees also increased. In addition, Coates (2007) notes that the additional costs of SOX are largely made up of a fixed part and the negative consequences are therefore more heavily experienced by smaller firms.

This increased burden put on, in particular, smaller companies is argued to have created a barrier for firms in accessing capital markets, leading to remarkably low IPO activity (Chaplinsky et al., 2017; Dambra et al., 2015). In 2012, the JOBS Act was enacted, and the section on EGC firms became effective immediately, with the intention of providing a solution to these recognized barriers. The Act is intended to alleviate some of the disadvantages, thereby improving opportunities for smaller companies. By decreasing the burden put on EGC firms, the JOBS Act is thus intended to reduce the costs of going public (Chaplinsky et al., 2017).

2.2 The IPO Process

Undergoing an IPO has a significant effect on a company. Besides the fact that the company shifts from being a private company to being a public company, and the inherent additional

scrutiny the company becomes subject to, the company is also subject to increased media attention (Daily et al., 2003).

The process of becoming a public company in the US through issuing an IPO generally follows a fixed set of steps. In the early stage of the IPO process, a company engages with an underwriter, typically an investment bank, with which it draws up the initial documents needed for filing with the SEC. After the registration documents have been filed publicly, the IPO candidate conducts what is known as a roadshow. During the roadshow, the company markets itself to potential investors and generates demand for its shares, typically among institutional investors. Once the roadshow is finalized, the underwriter and IPO-prospect set the price at which the shares are to be traded on the day of the IPO (Daily et al., 2003; Nova, 2019).

2.3 Qualifying for EGC Status and Exemptions for EGC Firms

To qualify for EGC status, companies may self-register as EGC with the SEC, but several thresholds are set after which a company may no longer apply EGC status. The thresholds relevant to EGC firms include having less than roughly \$1 billion in annual gross revenues, less than \$1 billion in non-convertible debt, and having a market value of less than \$700 million held by non-affiliates (JOBS Act, 2012).

The reduction in requirements for IPOs is seen in a variety of changes to the Securities Exchange Act of 1934. This includes changes to shareholder approval regulation and partial exemption from the required disclosures on executive compensation. EGCs no longer have to provide 3 years of audited financials for their IPO but are now required to provide 2 years of audited financials. Additionally, EGCs do not have to comply with new or revised accounting standards, as is normally the case for public companies or companies in the process of becoming public, but may delay their compliance until these rules become generally applicable to non-public companies. EGCs are also exempt from the rules mandating audit firm rotation and the verification of the management report on ICs by a public accounting firm (JOBS Act, 2012).

Another favorable provision available to EGC IPOs is the possibility of initially filing documents confidentially with the Securities Exchange Commission (SEC) (JOBS Act, 2012). EGCs may file their draft registration statements confidentially, but this comes with the requirement of filing the documents publicly only three weeks prior to the roadshow at latest (Westfall & Omer, 2018). The confidential filing option is seen as a popular option, with roughly 90% of all EGC issuers making use of this option, as it allows companies to keep information from competitors while deciding on whether to continue with their IPO (Dambra et al., 2015). As of 2017, this provision has been extended to apply to non-EGCs (SEC, 2017).

Table 1: Overview of JOBS Act Provisions

Provisions	EGC filers	Non-EGC filers
Number of years of audited financial statements	2 years	3 years
Number of years of selected financial data	2 years	5 years
Executive compensation disclosure	Disclosure required on 3 executives	Disclosure required on 5 executives
Complying with new or revised accounting regulation	May delay compliance until rules become applicable to private firms	Not Exempt
Mandatory auditor rotation	Exempt	Not exempt
SOX 404(b) compliance	Exempt	Not exempt unless filing as non-accelerated filer ²
Confidential filing	Applicable	Became applicable in 2017
Testing-the-waters	Applicable	Became applicable in 2019

Notes: This table presents an overview of the JOBS Act provisions applicable and of interest in the IPO process. Provisions not of interest to this situation and therefore excluded from this paper, such as those applicable to the issuance of debt securities, have been excluded from the table.

EGC firms also have the so-called “testing-the-waters” option, which allows them to disclose some information to certain potential investors to measure expected interest among investors (JOBS Act, 2012). Prior research finds that companies with IPOs that are often more prone to failure, such as biotech and research-intensive firms, are more likely to make use of this provision (Dambra et al., 2015). As of the end of 2019, the “testing-the-waters” provision has also become available to non-EGC firms (SEC, 2019).

Dambra et al. (2015) classify the beforementioned provisions as either having a de-burdening or de-risking effect on an EGC firm in the process of going public. Given that both de-risking provisions have become available to non-EGC firms as well, the difference in filings of EGC firms compared to non-EGC firms is limited to the opportunity to adopt the de-burdening provisions. An overview summarizing the provisions of the JOBS Act that have an influence on the IPO landscape is presented in Table 1.

2.4 IPO Underpricing

The initial price at which the IPO is brought to the market is often below the actual value, also called the underpricing of the IPO. The seminal paper by Rock (1986) argues that underpricing is the result of asymmetric information regarding the true value of the shares that exists between informed and uninformed investors. Information asymmetry can be seen in the difference in information known by the company compared to by investors as well as the difference in information available among investors (Johnston & Madura, 2009; Rock, 1986). Informed

² Non-accelerated filers are exempt from the auditor attestation per SOX 404(b) under the Dodd-Frank Act.

investors are argued to have considerably more information about the firm than their uninformed counterparts. As uninformed investors know their inherent limitations with regards to recognizing the true value of the shares, they decrease their spending capacity to offset the risk of buying overpriced shares. Firms issuing an IPO therefore have to decrease their offering price to meet this new price equilibrium in the market in order to also attract the uninformed investors (Rock, 1986).

Another theory argued to explain the underpricing phenomenon is the riskiness of the IPO. The riskiness of an IPO is considered to influence its underpricing in two ways. First, the risk composition hypothesis states that, as a result of the information asymmetry as discussed by Rock (1986), riskier IPOs will be underpriced more than less-risky IPOs as the uninformed investors have to discount their price limit more to make up for the additional risk these investors are subject to (Beaulieu & Bouden, 2015; Loughran & Ritter, 2004; Wang & Wilkins, 2007). Second, for riskier IPOs underpricing is used as an insurance against the higher litigation risk these IPOs are subject to (Muzatko et al., 2004; Lowry & Shu, 2002). This litigation-risk hypothesis argues that as the potential damages that can be obtained by the suing party are greatly dependent on the offering price, underpricing reduces the potential damages that may be obtained by the accuser and thus reduces the likelihood of such a lawsuit (Lowry & Shu, 2002; Wang & Wilkins, 2007).

This reduction in price compared to the actual value of the shares is seen in the difference between the price at which the shares are brought to the market and the closing price on the first day of trading. According to the efficient capital markets theory, information is instantly incorporated into the share price. The share price thus encompasses all available information (Fama, 1970). The price of the IPO shares at the end of the first trading day therefore reflects the true value of the shares, which allows for determining whether a share was underpriced and the level of underpricing.

Although firms are argued to reduce the share price to attract uninformed investors which is deemed essential for the IPO, underpricing itself is not necessarily considered to be positive for IPO firms. Underpricing is often referred to as “money left on the table” as the shares were essentially sold at a discount (Demers & Lewellen, 2003). Interestingly, there have been significant changes in the level of underpricing over the last decades. Historically, IPOs have left approximately 16% of value on the table (Daily et al., 2003). Loughran and Ritter (2004) state that underpricing was as low as 7% during the 1980s but reached an all-time high of 65% on average around the year 1999. This provides a somewhat distorted figure however, as Demers and Lewellen (2003) find that the average underpricing was 23% during the 1990s.

According to Johnston and Madura (2009), underpricing has significantly decreased since the adoption of SOX in 2002.

2.5 *Audit Quality*

Among the documents needed for filing are the audited financials. With their expertise, auditors lend credibility to financial statements as they provide assurance to the users of these financial statements (DeFond & Zhang, 2014). Audit quality is a frequently used concept in the accounting academic literature. Knechel, Krishnan, Pevsner, Shefchik and Velury (2013) state that what is perceived as audit quality depends on the type of user of the financial information presented. Nonetheless, the consensus is that audit quality refers to the service provided by an independent expert (Knechel et al., 2013). One of the most referred to definitions of audit quality was provided by DeAngelo in 1981, who defines audit quality as “the market-assessed joint probability that a given auditor will both (a) discover a breach in the client’s accounting system, and (b) report the breach” (p. 186).

As audit quality is seen as the outcome of the service delivered by an auditor and how it is perceived depends on the user of the information, an inherent difficulty prevails in measuring this concept. Research by DeAngelo (1981) finds that the auditor’s firm size is a good indicator of audit quality. Prior research examining the relationship between audit quality and IPO underpricing has primarily adopted this approach. Audit quality is treated as a binary variable: either a firm is audited by a Big N auditor signaling high audit quality, or the audit quality of the audited financials is hypothesized to be significantly lower (Beatty, 1989; Chang, Gygax, Oon & Zhang, 2008; DeFond & Zhang, 2014; Wang & Wilkins, 2007; Westfall & Omer, 2018). Although this is a frequently adopted approach, the results are inconclusive. While most papers find that underpricing is indeed lower for companies audited by Big N firms (DeFond & Zhang, 2014; Wang & Wilkins, 2007), the research by Chang et al. (2008) finds that underpricing is higher for firms audited by a Big 4 auditor. Solely regarding audit firm size as audit quality indicator is prone to considerable measurement error (Beatty, 1989). It neglects the differences that exist between Big N audit firms and the fact that audit quality is not a consistent value but is influenced by a variety of factors that change over time, such as engagement level or firm level factors (IFAC, 2014), thus likely yielding inconclusive results. More recent research by Hoag et al. (2017) finds that, although a popular measure for audit quality, the validity of this measure has decreased after the implementation of SOX.

In a research focusing on the explanatory power of audit quality indicators, Rajgopal, Srinivasan and Zheng (2021) find that restatements, total accruals, the ratio of audit fees to total

fees, and whether a company is audited by a specialist auditor are the best predictors of audit quality.³ More specifically, restatements and total accruals are referred to as being “output-based proxies” and signal low audit quality, whereas the ratio of audit fees to total fees and involving a specialist auditor are “input-based proxies” and signal high audit quality. In this classification of audit quality measurements, it follows the paper by DeFond and Zhang (2014) who argue that audit quality can essentially be measured from an input and output side. Given the various facets encompassing audit quality, DeFond and Zhang (2014) encourage the use of a variety of measures for audit quality to ensure a thorough analysis. This is also the approach adopted in this research.

2.6 The Consequences of the JOBS Act

Since the JOBS Act was enacted, some developments were noticeable in the capital markets. While controlling for potential market effects, Dambra et al. (2015) find that the number of IPOs have increased with 25% since the enactment. According to a PwC (2018) publication, more than 80% of IPOs registered since the Act came into effect were attributable to EGCs.

Although the JOBS Act provides EGC firms with various opportunities for reduced disclosure, an EGC can select which provisions it wishes to make use of. A PwC (2018) publication shows that 26% (30%) of EGC firms presented the usual three (five) years of audited financial statements (selected financial information). Moreover, on average 88% of EGCs presented compensation information for less than five executives and 84% of EGCs made use of the provision of delaying compliance with new accounting regulation.

Considering the underpricing of EGC firms’ IPOs specifically, prior research by Barth et al. (2017) finds that EGC firms have significantly more underpricing than similar firms that would have been EGC firms if they would have issued their IPO after the JOBS Act was enacted. In a similar manner, the papers by Chaplinsky et al. (2017) and Westfall and Omer (2018) also find that EGC firms experience significantly higher underpricing.

Interestingly, regarding the intended reduction in costs, the results are inconclusive. Prior research by Chaplinsky et al. (2017) finds no reduction in the direct costs related to the IPOs of EGCs compared to those of non-EGC firms. This is in contrast to the paper by Westfall and Omer (2018), who find that EGCs that make use of the de-burdening exemptions provided by the JOBS Act with regards to information disclosure have significantly lower accounting fees. This result is, however, only significant when considering companies that apply both the

³ The research by Rajgopal et al. (2021) studies to which extent fourteen popular measurements of audit quality predict six main audit deficiency categories.

provision of a reduction in the number of years of presented selected financial information as well as a reduction in the number of years of presented audited financials. In their research, accounting fees represent a measurement for the concept of auditor effort. Consequently, Westfall and Omer (2018) contribute the negative relationship between fewer years of financial disclosures and IPO accounting fees to a reduction in the effort required from auditors in the IPO process.

The inconclusive results might be the consequence of threats to the validity of the measurement used by Westfall and Omer (2018). While they note that accounting fees have often been used as a measurement for auditor effort, they only consider the absolute effect of reduced information disclosure on accounting fees rather than the relative effect. Although absolute total direct costs might have decreased, this may not undoubtedly be the case for relative total costs. If the relative total costs did not change for EGC firms compared to non-EGC firms, relative auditor effort is likely to have remained either unchanged or has increased as a result of the JOBS Act. This result would be in line with the research by Chaplinsky et al. (2017). As underpricing is found to be higher for EGC firms, the consequential effect of no reduction in costs in combination with underpricing is a reduction in the IPO proceedings for EGC firms. All in all, the intended effects of the JOBS Act that a reduction in disclosure costs would result in a favorable outcome in terms of costs for EGC IPOs is doubtful.

Whether the JOBS Act was successful in achieving the intended effects is questionable. Dambra et al. (2015) find that the de-risking provisions have resulted in an increase in IPO activity. These provisions have, however, also become available to non-EGC firms, and therefore no longer provide special market circumstances for EGC firms. Moreover, given that the intended reduction in costs in combination with the increase in underpricing results in lower IPO proceeds, the effectiveness of the JOBS Act is debatable. To add to this debate, I consider the mitigating effect audit quality might play in this context.

2.7 Hypotheses Development

The goal of financial information is to reduce the information asymmetry between informed and uninformed parties. Given that EGCs have less obligations when it comes to providing financial information for their IPOs, the information asymmetry is argued to be higher for EGC firms than for non-EGC firms. As underpricing is the result of information asymmetry (Rock, 1986), underpricing is expected to be significantly higher for EGC firms. Prior research shows that this is indeed the case (Barth et al., 2017; Chaplinsky et al., 2017; Westfall & Omer, 2018). Audit quality is expected to mitigate this effect in two ways. Firstly, as often little information

is known about IPO firms, the quality of the information presented is of great importance (Weber & Willenborg, 2003). High audit quality positively contributes to financial reporting quality (DeFond & Zhang, 2014), and thus is expected to reduce information asymmetry. Secondly, high audit quality can serve as an insurance for the litigation risk firms are subject to (Muzatko et al., 2004). Higher audit quality is therefore expected to reduce the need for underpricing as an insurance mechanism for the IPOs of EGC firms. Considering the beforementioned effects, I hypothesize the following:

H₁: Audit quality is negatively associated with the level of underpricing of EGC IPOs.

Another important aspect of the JOBS Act is the possibility of making use of various provisions that reduce the burden put on IPO firms. Considering that EGC firms can select which provisions they wish to make use of, differences in the quantity of information disclosed in prospectuses exist among EGC firms. I argue that the difference in information disclosed increases information asymmetry among IPO firms. In particular, I focus on two important JOBS Act provisions: the extended period of adoption of accounting changes and voluntary ICWs disclosure.

First, one provision of the JOBS Act provides firms with the opportunity of making use of an extended time period for adopting new or modified accounting standards. Companies making use of this provision thereby no longer have to abide by these rules in the same time frame as other public companies, but only must comply when these rules become applicable to private firms as well. This provision also puts firms in an all or nothing situation in which they either avail of the extended period for all accounting regulation changes or irrevocably comply with all regulation as applicable to public firms. The consequence of delaying compliance lies in the comparability of financial statements. If firms do not present financial information according to the same rules, this makes comparing information across firms inherently more difficult. In determining the value of an IPO, typically a comparison is made to a peer firm to make up for the scarcity of information known about the IPO firm, thereby reducing information asymmetry. If an EGC firm makes use of the extended adoption period provision, the comparability to a peer public firm not making use of this extended adoption period therefore diminishes. Accordingly, I argue that information asymmetry is higher for firms making use of the extended period provision, resulting in higher IPO underpricing.

Second, in addition to the exemption of the auditor report on ICs under SOX 404 (b), companies only have to file a management report assessing the effectiveness of ICs over financial reporting (SOX 404 (a)) as of their second filed annual report. EGC firms that disclose

information on ICWs in their prospectus therefore do so voluntarily. Regarding the JOBS Act provision on the ICs report, a 2019 Public Company Accounting Oversight Board (PCAOB) white paper specifies that of the EGC firms that provided a management report on ICs, 45% reported one or more material ICWs (PCAOB, 2019). Basu, Krishnan, Lee and Zhang (2018) state that the voluntary disclosure of ICWs reduces information asymmetry and can also serve as an insurance in an IPO setting. They argue that in the preparation of the IPO registration documents, the involved parties have performed their work more diligently, thereby detecting and deciding to report on these ICWs. While their paper focuses on IPOs in general, I argue this effect to be similar for EGC firms. When firms report on the existence of ICWs and the subsequent remediating actions that have been taken or are still in the process of implementation, this decreases the information gap between insiders (the firm) and outsiders (investors).

Considering the expected increase in information asymmetry when making use of the extended period for adopting accounting rules and the expected decrease in information asymmetry for when disclosing on ICWs, I hypothesize the following additional hypotheses:

H₂: Underpricing is higher for EGC IPO firms making use of the extended period for complying with changes in accounting standards than for firms voluntarily and irrevocably electing not to make use of this provision.

H₃: Underpricing is lower for EGC IPO firms with proactive disclosure of ICWs than for firms not disclosing on ICWs.

3. Sample Selection and Research Design

3.1 Measuring Audit Quality

Conforming to the paper by DeFond and Zhang (2014), I make use of a variety of measures for audit quality. The first measure is based on the yearly PCAOB audit firm specific inspection reports (*Inspec*). As part of the adoption of SOX, the PCAOB conducts these inspections on large audit firms annually to assess their compliance with regulatory and professional standards and rules. For each report, the PCAOB collects a sample of audits for review and determines if these audits contain material deficiencies at the time of investigation (PCAOB, n.d.). These reports therefore represent a repeated external scrutinization on the work performed by an auditor. If audit quality at an audit firm is high, the work performed by the auditor should be in line with regulatory and professional standards, leading to no or a reduced number of deficiencies in the work performed. The number of deficient audits is thus indicative of audit quality from an input perspective. Additionally, prior research indicates that the introduction of

these independent reports, rather than the initially applied peer review process, has a positive effect on audit quality (DeFond & Lennox, 2011; Knechel, 2015). Gunny and Zhang (2013) find that audit quality, proxied by abnormal accruals and restatements, of large audit firms is lower if the PCAOB issued an inspection report showing deficiencies. Moreover, Nagy (2014) finds that if the PCAOB reports a significant quality control deficiency of a firm, this negatively impacts the audit firm's market share, indicating that the PCAOB reports are perceived to have a signaling role regarding audit quality. *Inspec* is measured by the ratio of deficient audits to the total number of audits in the PCAOB reports per audit firm per respective year. For each of the sampled firms, the *Inspec* ratio is set to the value of the last financial year before the IPO, as this captures the audit quality of the auditor of the audited financial statements accompanying the IPO prospectus.

In line with the findings by Rajgopal et al. (2021), I use the ratio of audit fees to total fees as second audit quality proxy (*FeeRatio*). Similar to Rajgopal et al. (2021), Chen, Lin and Siregar (2018) argue that as the ratio increases, the audit firm is less dependent on the specific client apart from the audit. This ratio therefore signals auditor independence, which is argued to be a good input indicator of audit quality by IFAC (2014).

The research by Willenborg and McKeown (2001) finds that going concern information adds substantial value to determining the true value of an IPO. They argue that a going concern opinion reveals otherwise private information, thereby reducing the information gap between insiders and outsiders. While audit firms must disclose information when this substantial doubt exists, reporting on going concern issues can have adverse effects for the auditor. Given the negative consequences for the company under audit, it can pressure its auditor to not issue a going concern opinion or threaten with auditor dismissal (Carey, Geiger & O'Connell, 2008; Carcello & Neal, 2003). Carey et al. (2008) find that auditors issuing a going concern opinion experience a significant loss of audit revenues due to this opinion compared to firms that did not issue such an opinion. If auditors perform their work diligently, they are thus expected to be more likely to find and report on these concerns regarding a company's ability to continue to exist despite the pressure and potential repercussions. An issued going concern opinion (*GC*) for the audited financials accompanying an IPO therefore signals high audit quality from an output perspective and is used as third audit quality proxy.

Auditor industry specialization (*IndustrySpecialist*) is the last proxy used to measure audit quality. In line with prior research, expert auditors are argued to provide higher audit quality as they can capitalize knowledge across the firm and are incentivized to maintain their reputational position in the market (DeFond & Zhang, 2014; Reichelt & Wang, 2010). It is therefore an

input audit quality indicator. Following the paper by Reichelt and Wang (2010), I regard an auditor as *IndustrySpecialist* if it has more than 30% of annual national market share in the client firm's two-digit SIC code.

3.2 Sample Selection

I start the construction of my sample by collecting data on all IPOs in the Audit Analytics database between January 1st, 2016, and December 31st, 2019, resulting in an initial sample of 880 IPOs. In contrast to current research on the JOBS Act focusing on the early years after enactment, I consider IPOs a few years after the adoption. An EY (2019) publication shows a significant increase in the number of IPOs right after enactment of the Act. This effect however did not prolong but decreased to a more persistent equilibrium. Some de-burdening provisions, on the other hand, only significantly increased in later years. Considering only the early years might therefore present a distorted figure that is unlikely to persist. Moreover, the sample includes the full years till the start of the Covid-19 crisis, to prevent including its effect.

For the sample, I exclude spin-offs, mergers, IPOs emerged from bankruptcy, reorganizations, and real estate investment trusts. To account for the inherent differences between smaller auditors and Big 4 firms, I only retain the EGCs audited by Big 4 audit firms.⁴ I remove observations belonging to shell or blank firms as the business purpose of these firms makes comparison to the other firms inappropriate. Additionally, I retain the IPOs listed on NASDAQ or NYSE. I also drop observations of all foreign issuers registered with form F-1 or F-1/A as these firms are exempt from certain requirements that US based firms must comply with, thereby diminishing comparability. Following prior research by Westfall and Omer (2018), I exclude financial services and utility firms. Lastly, I remove observations with missing data. The full sample selection procedure is outlined in table 2, panel A, and results in a final sample of 212 IPO observations.

3.3 Research Design

To examine the relationship between audit quality and IPO underpricing for EGC firms as hypothesized by the primary hypothesis, I test the following OLS model:

$$\begin{aligned} \text{Underpricing} = & \beta_0 + \beta_1 AQ + \beta_2 \ln \text{FirmSize} + \beta_3 \ln \text{Revenue} + \beta_4 \text{Loss} + \beta_5 ROA \quad (1) \\ & + \beta_6 \ln \text{Age} + \beta_7 VC + \beta_8 \text{Tech} + \beta_9 \ln \text{IssueSize} + \beta_{10} VIX + \varepsilon \end{aligned}$$

⁴ The Big 4 firms for the sample period are: Deloitte & Touche LLP, Ernst & Young LLP, KPMG LLP, and PricewaterhouseCoopers LLP.

Table 2: Sample

Panel A: Sample Selection	
All IPOs in the Audit Analytics database with IPO dates in 2016 to 2019	880
Less: Spin-offs, Mergers, Emerged from bankruptcy, and Reorganizations	(44)
Less: Auditor at IPO date is not a Big 4 firm	(333)
Less: Shell or blank firms	(3)
Less: IPOs not issued on NYSE or Nasdaq	(43)
Less: Real Estate Investment Trusts (REITs) and foreign issuers	(145)
Less: Financial services (SIC 6000-6999) and utility (SIC 4900-4999) firms	(30)
Less: Non-EGC issuers	(33)
Less: Observations with missing data in CRSP, Compustat, the Ritter IPO database or with missing audit fee and total fee data in Audit Analytics	(37)
Number of IPO observations used in sample	212

where *Underpricing* is defined as the difference between the first day closing price and offer price divided by the offer price. The variable of interest *AQ* is measured by the four measures of audit quality: *Inspec*, *FeeRatio*, *GC* and *IndustrySpecialist*.

To control for the potential effects of various influential factors, I include a variety of control variables. First, I include various firm specific variables that are all measured according to the latest audited annual financial statements before the IPO. In line with Barth et al. (2017), I include *FirmSize* and *Revenue*. Following Westfall and Omer (2018), I include *Loss* and *ROA*. *Age* controls for the age of the firm (Wang & Wilkins, 2007). Second, I include a variety of variables controlling for IPO specific influences. Prior research finds that venture capital backed IPOs experience significantly greater levels of underpricing (Kirshnan, Ivanov, Masulis & Singh, 2011). Therefore, in line with previous IPO research, I include *VC*, an indicator variable for a venture capital backed IPO (Basu et al., 2018; Chang et al., 2008; Johnston & Madura, 2009). *Tech* indicates whether the firm is a technology firm and is included because these firms typically report significantly higher underpricing than other IPO firms (Basu et al., 2018; Muzatko et al., 2004). Kumar, Langberg and Sivaramakrishnan (2016) find that more information is made available by a company when the size of the equity issue is greater, indicating that information asymmetry is inherently lower for greater equity issues. I control for this effect by including *IssueSize*. Lastly, to control for potential market inherent influences, I include the variable *VIX*. As per Beaulieu and Bouden (2015), the VIX index is a measure for expected uncertainty in the market, based on S&P 500 predictions. For the specific definitions and measurements of the control variables, refer to Appendix A.

To examine the relationship between the adoption of the extended compliance period and the voluntary disclosure of ICWs and IPO underpricing, as specified in hypothesis 2 and 3, I test the following additional OLS models:

$$\begin{aligned} \text{Underpricing} = & \beta_0 + \beta_1 \text{ExtendedCompl} + \beta_2 \text{AQ} + \beta_3 \text{ExtendedCompl} \cdot \text{AQ} \\ & + \beta \text{Controls} + \varepsilon \end{aligned} \quad (2)$$

$$\text{Underpricing} = \beta_0 + \beta_1 \text{ICW} + \beta_2 \text{AQ} + \beta_3 \text{ICW} \cdot \text{AQ} + \beta \text{Controls} + \varepsilon \quad (3)$$

where *ExtendedCompl* and *ICW* are the indicator variables of interest. *ExtendedCompl* is a dummy variable equaling one if the firm has opted to avail of the extended period for adopting changes in accounting regulation in its last publicly filed prospectus before IPO, and zero otherwise. *ICW* is a dummy variable equaling one if the firm has included information on ICWs in its last publicly filed prospectus before IPO, and zero otherwise. Firms can disclose information on ICWs in two ways: (1) a company specifies it has previously identified ICWs that have been remediated, or (2) a company specifies it has identified ICWs that have not been remediated at the time of filing. If a firm provides information on ICWs in such a way, this reduces the information asymmetry between insiders and outsiders. Therefore, in both instances, the firm is assigned a value of one. Additionally, I also include the interaction effect of the measures for audit quality and the *ExtendedCompl* and *ICW*. For regression models 2 and 3, the same control variables are used as for regression model 1. For a detailed description of all variables, refer to Appendix A.

3.4 Data Collection

I collect data on shares, such as the closing prices, from the CRSP database. IPO and audit fee data is obtained from Audit Analytics. Company specific data is obtained from Compustat and Audit Analytics. Data on PCAOB inspection reports is manually collected from the PCAOB reports website.⁵ VIX values are obtained from the CBOE Indexes database. Information on JOBS Act provisions is manually collected from each observation's prospectus through the SEC EDGAR database. Going concern data is collected from Audit Analytics and, if missing, supplemented by manual prospectus inspection through the SEC EDGAR database. Data on firm age and venture capital backing is obtained from the Ritter IPO database.⁶ For a complete overview of data collection, refer to Appendix A.

⁵ For more information on the manual data collection, refer to Appendices B and C.

⁶ Jay R. Ritter is a prominent professor known for his research on IPOs. His work has been cited over 50,000 times and he has published various seminal papers. His database is therefore considered to be a reliable source. The data is obtained from <https://site.warrington.ufl.edu/ritter/ipo-data/>.

Table 3: Sample Distribution

Panel A: Distribution sample per auditor per IPO year						
	2016	2017	2018	2019	Total	%
Deloitte & Touche LLP	6	8	13	14	41	19.3%
Ernst & Young LLP	10	19	19	26	74	34.9%
KPMG LLP	7	3	16	13	39	18.4%
PricewaterhouseCoopers LLP	8	11	27	12	58	27.4%
Total	31	41	75	65	212	100%

Panel B: Distribution extended compliance provision and voluntary ICWs disclosure per IPO year						
	2016	2017	2018	2019	Total	%
Opt-in extended compliance	2	12	38	41	93	43.9%
Opt-out extended compliance	29	29	37	24	119	56.1%
Total	31	41	75	65	212	100%
Voluntary disclosure ICW	14	13	23	24	74	34.9%
No disclosure ICW	17	28	52	41	138	65.1%
Total	31	41	75	65	212	100%

	Voluntary disclosure	Observations	%
ICWs remediated		20	27.0%
ICWs not remediated		54	73.0%
Total		74	100%

Panel C: Distribution per industry				
SIC	Industry	Observations	%	
12	Coal Mining	1	0.47%	
13	Oil & Gas Extraction	6	2.83%	
20	Food & Kindred Products	2	0.94%	
23	Apparel & Other Textile Products	1	0.47%	
28	Chemical & Allied Products	102	48.11%	
35	Industrial Machinery & Equipment	2	0.94%	
36	Electronic & Other Electric Equipment	14	6.60%	
38	Instruments & Related Products	15	7.08%	
39	Miscellaneous Manufacturing Industries	2	0.94%	
48	Communications	1	0.47%	
50	Wholesale Trade – Durable Goods	1	0.47%	
51	Wholesale Trade – Nondurable Goods	1	0.47%	
57	Furniture & Home Furnishings Stores	1	0.47%	
58	Eating & Drinking Places	1	0.47%	
59	Miscellaneous Retail	4	1.89%	
73	Business Services	53	25.00%	
80	Health Services	4	1.89%	
87	Engineering & Management Services	1	0.47%	

Notes: Panel A shows the distribution of the number of IPOs per IPO sample year per Big 4 audit firm. Panel B shows the distribution of the voluntary adoption of ICWs as well as the adoption of the provision allowing EGC firms to extend compliance with changes in accounting regulation. “Voluntary disclosure ICW” includes both

firms reporting remediated ICWs in their prospectus as well as firms reporting that identified ICWs have not been remediated. Panel C shows the distribution of the entire sample among the two-digit SIC codes present in the sample.

4. Results

4.1 Descriptive Statistics

Table 3 presents the distribution of the sample. Panel A shows the distribution of the number of IPOs per year and per audit firm. Across the sample, differences in the number of IPOs audited per year and by each audit firm exist, but the observations do not seem to be significantly clustered. Panel B shows the distribution of the various JOBS Act provisions. As all firms in the sample chose to make use of the provision exempting them from providing an auditor attestation on IC, it is interesting to note that 74 firms voluntarily disclosed ICW information in their prospectus. Of the companies voluntarily disclosing ICWs, the majority (54) report that ICWs have not been remediated at the time of filing. With regards to the provision offering the opportunity to make use of an extended time period for adopting regulatory accounting changes, a noteworthy trend is seen over time. Whereas very few companies in the sample adopted this provision at the start of the sample period, increasingly more companies did so throughout the sample period. This is in line with the 2019 report by EY, which states that EGC firms are increasingly adopting this provision. Similar to the PwC (2018) publication, only 6.5% of EGCs in the sample adopted this provision in 2016, but this increased to almost 30% in 2017.

Table 3, Panel C shows the distribution of the observations among the two-digit SIC codes present in the sample. Noticeable, the majority of observations are in the chemical industry, of which most observations belong to pharmaceutical companies, and in business services, of which most observations belong to firms in the prepackaged software industry. The results are in line with Dambra et al. (2015) who note a significant increase in the number of IPOs in the pharmaceutical and computer software industry after the enactment of the JOBS Act.

Table 4 reports the descriptive statistics of the sample. Among the sample of 212 IPOs, the mean value for *Underpricing* is 23.5%, which is consistent with prior research (Barth et al., 2017; Westfall & Omer, 2018). This indicates that, on average, the firms in the sample leave a significant portion of money on the table. The median value for *FeeRatio* is close to one, indicating that firms typically do not significantly engage with their auditor for other services than the audit. In line with Reichelt and Wang (2010), 24% of firms in the sample employ an *IndustrySpecialist* for the audit of the financial statements accompanying their prospectus.

Table 4: Descriptive Statistics

	N	Mean	Median	Std.	Min	Max
Variables of Interest						
<i>Underpricing</i> ⁷	212	0.235	0.175	0.386	-0.411	3.492
<i>Inspec</i>	212	0.278	0.259	0.089	0.103	0.500
<i>FeeRatio</i>	212	0.885	0.976	0.185	0.200	1
<i>GC</i>	212	0.189	0	0.392	0	1
<i>IndustrySpecialist</i>	212	0.241	0	0.428	0	1
<i>ExtendedCompl</i>	212	0.439	0	0.497	0	1
<i>ICW</i>	212	0.349	0	0.478	0	1
Control Variables						
<i>FirmSize</i> (\$m)	212	254.484	97.891	371.953	4.155	1,706.262
<i>Revenue</i> (\$m)	212	139.774	31.562	217.719	0	970.304
<i>Loss</i>	212	0.882	1	0.323	0	1
<i>ROA</i>	212	-0.494	-0.290	0.803	-5.449	0.309
<i>Age</i>	212	10.667	8.5	8.223	2	47
<i>VC</i>	212	0.825	1	0.380	0	1
<i>Tech</i>	212	0.302	0	0.460	0	1
<i>IssueSize</i> (\$m)	212	190.567	120	230.375	36	1,416.349
<i>VIX</i>	212	14.157	13.42	3.026	9.220	26.050

Notes: This table presents the descriptive statistics for all variables used in the various regression models. For all variables which are logarithmically transformed for the OLS regressions, the descriptive statistics are presented without transformation. \$m depicts that the values are in millions of dollars. The following continuous variables are winsorized at 1% and 99% levels: *FirmSize*, *Revenue*, *ROA*, *Age*, *IssueSize*.

Additionally, about 18.9% of EGC sample firms have an issued *GC* opinion along with their filed prospectus, which is also consistent with prior research (Dambra et al., 2015). The EGC firms in the sample are on average not profitable, have existed for almost eleven years at the time of their IPO, and have raised \$191 million with their IPO. The vast majority of IPOs (85%) are venture capital backed-backed. Similar to tech stock IPO data published on Ritter's IPO website, about 30% of all sampled IPOs pertain to tech firms.

Table 5 provides the correlation matrix of the variables used. In general, the matrix shows no strong linear correlation (correlation exceeding $|0.700|$). Most variables show sufficiently low correlation (correlation $< |0.400|$), thereby appearing to rule out potential collinearity issues. A few control variables show a modest correlation (correlation $> |0.400|$) but generally lack noteworthy correlation with the independent variables of interest. Only one control variable, *ln*

⁷ Given the large variance of the dependent variable *Underpricing*, two additional tests are performed to check whether results hold. (1) *Underpricing* is winsorized at the 1% and 99% levels, with a new mean value of 0.223 and a standard deviation of 0.314. (2) Outliers are removed from *Underpricing*. I determine outliers based on z-score and remove observations with an absolute z-score for *Underpricing* exceeding 3. The reduced sample includes 210 observations and has a mean value of 0.213 and a standard deviation of 0.300.

Table 5: Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Underpricing</i>	(1)							
<i>Inspec</i>	(2)	0.029						
<i>FeeRatio</i>	(3)	0.030	0.008					
<i>GC</i>	(4)	-0.132*	-0.044	0.104				
<i>IndustrySpecialist</i>	(5)	0.017	-0.061	-0.01	0.123*			
<i>ExtendedCompl</i>	(6)	0.102	-0.054	-0.086	-0.110	-0.119*		
<i>ICW</i>	(7)	0.037	-0.087	-0.101	0.001	0.051	-0.109	
<i>ln FirmSize</i>	(8)	0.119*	-0.137**	-0.215***	-0.427***	-0.101	0.105	0.05
<i>ln Revenue</i>	(9)	0.267***	-0.049	-0.173**	-0.354***	-0.051	0.126*	0.108
<i>Loss</i>	(10)	-0.153**	0.001	0.100	0.176**	-0.102	-0.001	-0.100
<i>ROA</i>	(11)	0.108	0.088	-0.154**	-0.333***	-0.078	0.027	0.017
<i>ln Age</i>	(12)	0.177**	-0.004	-0.099	-0.193***	0.054	0.054	0.112
<i>VC</i>	(13)	0.110	0.062	0.101	-0.032	-0.003	-0.019	-0.237***
<i>Tech</i>	(14)	0.293***	0.062	0.012	-0.133*	-0.010	0.164**	0.036
<i>ln IssueSize</i>	(15)	0.126*	-0.176**	-0.120*	-0.304***	-0.035	0.150**	-0.050
<i>VIX</i>	(16)	0.082	0.057	0.032	-0.216***	-0.069	0.159**	-0.022
		(9)	(10)	(11)	(12)	(13)	(14)	(15)
<i>Loss</i>	(10)	-0.351***						
<i>ROA</i>	(11)	0.438***	-0.266***					
<i>ln Age</i>	(12)	0.587***	-0.337***	0.123*				
<i>VC</i>	(13)	-0.240***	0.217***	-0.019	-0.314***			
<i>Tech</i>	(14)	0.428***	-0.078	0.153**	0.326***	-0.05		
<i>ln IssueSize</i>	(15)	0.529***	-0.04	0.162**	0.191***	-0.03	0.143**	
<i>VIX</i>	(16)	0.007	0.035	-0.004	-0.086	0.004	0.071	0.191***

Notes: Pearson correlation matrix of the variables used in the various linear regression models. Moderate correlations (exceeding 0.400) are marked in bold. * indicates statistical significance (two-tailed) at $p < 0.1$, ** at $p < 0.05$, and *** at $p < 0.01$.

FirmSize, shows a modest relation with independent variable *GC*. To prevent potential collinearity influences, an additional analysis will be performed excluding this control variable.

4.2 Audit Quality and Underpricing

Table 6 presents the results of the first linear regression equation, with *Underpricing* as dependent variable. In line with prior research, the model includes year and industry fixed effects to account for any inherent constant factors present on either year- or industry-level (Barth et al., 2017; Westfall & Omer, 2018).⁸ The four regression models in the table indicate the proxy for *AQ* which *Underpricing* is regressed on, with *Inspec*, *FeeRatio*, *GC* and *IndustrySpecialist* indicated by (1), (2), (3) and (4), respectively.

⁸ Given the small sample size and the limited number of observations for some of the two-digit SIC codes in the sample, all three regression equations are reperformed excluding industry fixed effects.

Table 6: Regression of Audit Quality Measures on IPO Underpricing

	Dependent Variable: <i>Underpricing</i>			
	(1)	(2)	(3)	(4)
Intercept	0.138 (0.794)	0.096 (0.859)	0.208 (0.689)	0.152 (0.769)
<i>Inspec</i>	0.111 (0.726)			
<i>FeeRatio</i>		0.075 (0.618)		
<i>GC</i>			-0.027 (0.722)	
<i>IndustrySpecialist</i>				0.031 (0.627)
ln <i>FirmSize</i>	0.027 (0.534)	0.025 (0.556)	0.022 (0.601)	0.024 (0.565)
ln <i>Revenue</i>	-0.001 (0.975)	-0.001 (0.969)	-0.001 (0.980)	0.00005 (0.999)
<i>Loss</i>	-0.179* (0.065)	-0.182* (0.061)	-0.178* (0.066)	-0.175* (0.074)
<i>ROA</i>	-0.035 (0.472)	-0.030 (0.530)	-0.033 (0.489)	-0.030 (0.522)
ln <i>Age</i>	0.026 (0.642)	0.030 (0.589)	0.027 (0.629)	0.027 (0.625)
<i>VC</i>	0.196** (0.013)	0.194** (0.014)	0.192** (0.016)	0.194** (0.014)
<i>Tech</i>	0.100 (0.348)	0.105 (0.321)	0.103 (0.331)	0.102 (0.337)
ln <i>IssueSize</i>	-0.037 (0.536)	-0.036 (0.542)	-0.037 (0.534)	-0.039 (0.515)
<i>VIX</i>	0.001 (0.930)	0.001 (0.919)	0.004 (0.973)	0.001 (0.902)
Year Fixed Effects	Included	Included	Included	Included
Industry Fixed Effects	Included	Included	Included	Included
N	212	212	212	212
Adj. R ²	0.115	0.115	0.115	0.115
F-Stat	1.912***	1.918***	1.913***	1.917***

Notes: This table presents the regression results for the effect of audit quality measures on IPO underpricing. The four models represent the four proxies for audit quality, where (1) is *Inspec*, (2) is *FeeRatio*, (3) is *GC*, and (4) is *IndustrySpecialist*. The regression results include industry (two-digit SIC code) and year fixed effects. *p*-values are shown in parentheses. The following continuous variables are winsorized at 1% and 99% levels: *FirmSize*, *Revenue*, *ROA*, *Age*, *IssueSize*. * indicates statistical significance (two-tailed) at $p < 0.1$, ** at $p < 0.05$, and *** at $p < 0.01$.

The independent variables that proxy for audit quality do not show a significant relationship with *Underpricing*.⁹ These results indicate that, with the tested confidence levels, the proxies for audit quality do not influence the level of underpricing for EGC IPOs, thus not

⁹ When estimating the regression in column (3) without the control variable ln *FirmSize* to prevent potential collinearity influences, the coefficient of *GC* remains statistically insignificant (-0.032, *p*-value = 0.674).

providing support for the first hypothesis.¹⁰ These results contradict the expected effect of audit quality on IPO underpricing according to the theory of information asymmetry.

Regarding the control variables included in the regression models in Table 6, very few show a statistically significant relationship with *Underpricing*. The coefficient on *Loss* is negative and statistically significant at the 10% significance level. The results indicate that EGC firms reporting a negative net income have significantly lower underpricing than firms reporting a profit. A potential explanation for this is that reporting a negative net income, as opposed to reporting a profit, reduces the risk of earnings management for outsiders. Prior research finds that a reduction in the risk of earnings management subsequently reduces information asymmetry (Abad, Cutillas-Gomariz, Sánchez-Ballesta & Yagüe, 2018). Furthermore, the coefficient on *VC* is positive and statistically significant at the 5% significance level. This is consistent with prior research indicating that venture capital backed IPOs experience significantly higher levels of underpricing (Kirshnan et al., 2011).

4.3 *Underpricing, JOBS Act Provisions and Voluntary ICW Disclosure*

Tables 7 and 8 report the results of the additional hypotheses. Table 7 reports the results of equation (2), examining the effect of adopting the provision of the extended transition period for complying with regulatory accounting changes and the various audit quality proxies on underpricing. Table 8 reports the results of equation (3), examining the effect of voluntarily disclosing information on ICWs in combination with audit quality on underpricing. Both models include year and industry fixed effects. Similar to Table 6, the four regression models in the table indicate the proxy for *AQ* which *Underpricing* is regressed on, with *Inspec*, *FeeRatio*, *GC* and *IndustrySpecialist* indicated by (1), (2), (3) and (4), respectively.

In line with the first regression equation only considering the effects of audit quality, Tables 7 and 8 both report insignificant coefficients for all standalone audit proxies. In addition, the findings in Table 8 show an insignificant relation between IPO underpricing and voluntary ICW disclosure for all four models.¹¹ These results indicate that neither the voluntary disclosure of ICWs, nor the interaction effect of voluntary ICW disclosure and audit quality, influence the level of IPO underpricing for EGC firms. Table 7 reports a significant (10% level) and negative

¹⁰ The results hold when industry fixed effects are excluded. The results also hold for the additional analysis in which the dependent variable *Underpricing* is winsorized at the 1% and 99% levels and for the additional analysis in which outlier observations are excluded.

¹¹ The results persist when estimating the regression in column (3), where *AQ* is *GC*, without the control variable $\ln FirmSize$ to prevent potential collinearity influences.

Table 7: Regression of Extended Compliance Period and Audit Quality on IPO Underpricing

	Dependent Variable: <i>Underpricing</i>			
	(1)	(2)	(3)	(4)
Intercept	0.418 (0.443)	0.056 (0.922)	0.198 (0.706)	0.177 (0.733)
<i>Extended_Cmpl</i>	-0.301* (0.095)	0.077 (0.779)	0.006 (0.927)	-0.001 (0.987)
<i>Extended_Cmpl * AQ</i>	1.145* (-0.064)	-0.070 (0.817)	0.033 (0.817)	0.089 (0.532)
<i>Inspec</i>	-0.568 (0.241)			
<i>FeeRatio</i>		0.114 (0.608)		
<i>GC</i>			-0.037 (0.686)	
<i>IndustrySpecialist</i>				0.004 (0.961)
<i>ln FirmSize</i>	0.034 (0.423)	0.025 (0.555)	0.023 (0.588)	0.026 (0.542)
<i>ln Revenue</i>	-0.007 (0.800)	-0.001 (0.970)	-0.002 (0.948)	-0.0005 (0.985)
<i>Loss</i>	-0.181* (0.061)	-0.178* (0.070)	-0.179* (0.068)	-0.160 (0.110)
<i>ROA</i>	-0.040 (0.410)	-0.030 (0.530)	-0.033 (0.484)	-0.033 (0.487)
<i>ln Age</i>	0.024 (0.673)	0.031 (0.584)	0.028 (0.618)	0.027 (0.633)
<i>VC</i>	0.199** (0.012)	0.198** (0.015)	0.194** (0.016)	0.191** (0.016)
<i>Tech</i>	0.088 (0.408)	0.102 (0.340)	0.103 (0.339)	0.098 (0.361)
<i>ln IssueSize</i>	-0.048 (0.423)	-0.036 (0.551)	-0.035 (0.554)	-0.040 (0.510)
<i>VIX</i>	-0.0003 (0.980)	0.001 (0.944)	0.0003 (0.977)	0.001 (0.933)
Year Fixed Effects	Included	Included	Included	Included
Industry Fixed Effects	Included	Included	Included	Included
N	212	212	212	212
Adj. R ²	0.122	0.106	0.105	0.108
F-Stat	1.919***	1.783***	1.777***	1.797***

Notes: This table presents the regression results for the effect of the JOBS Act provision of using the extended adoption period for regulatory accounting changes and audit quality measures on IPO underpricing. The four models represent the four proxies for audit quality, where (1) is *Inspec*, (2) is *FeeRatio*, (3) is *GC*, and (4) is *IndustrySpecialist*. *Extended_Cmpl * AQ* measures the interaction effect between the adoption of the provision and the audit quality proxy of the respective model. The regression results include industry (two-digit SIC code) and year fixed effects. *p*-values are shown in parentheses. The following continuous variables are winsorized at 1% and 99% levels: *FirmSize*, *Revenue*, *ROA*, *Age*, *IssueSize*. * indicates statistical significance (two-tailed) at $p < 0.1$, ** at $p < 0.05$, and *** at $p < 0.01$.

Table 8: Regression of Voluntary ICW Disclosure and Audit Quality on IPO Underpricing

	Dependent Variable: <i>Underpricing</i>			
	(1)	(2)	(3)	(4)
Intercept	-0.109 (0.842)	-0.113 (0.840)	0.139 (0.794)	0.101 (0.850)
<i>ICW</i>	0.286 (0.118)	0.363 (0.198)	0.045 (0.487)	0.067 (0.316)
<i>ICW * AQ</i>	-0.831 (0.184)	-0.349 (0.265)	0.046 (0.742)	
<i>Inspec</i>	0.454 (0.253)			-0.059 (0.664)
<i>FeeRatio</i>		0.218 (0.260)		
<i>GC</i>			-0.044 (0.631)	
<i>IndustrySpecialist</i>				0.051 (0.535)
ln <i>FirmSize</i>	0.034 (0.427)	0.029 (0.492)	0.021 (0.614)	0.023 (0.584)
ln <i>Revenue</i>	-0.004 (0.891)	-0.004 (0.887)	-0.0003 (0.990)	0.001 (0.980)
<i>Loss</i>	-0.195** (0.046)	-0.187* (0.054)	-0.183* (0.061)	-0.180* (0.067)
<i>ROA</i>	-0.039 (0.424)	-0.028 (0.551)	-0.030 (0.522)	-0.030 (0.522)
ln <i>Age</i>	0.038 (0.510)	0.036 (0.526)	0.029 (0.606)	0.026 (0.648)
<i>VC</i>	0.210*** (0.010)	0.209*** (0.010)	0.206** (0.012)	0.208** (0.011)
<i>Tech</i>	0.097 (0.360)	0.107 (0.315)	0.102 (0.336)	0.101 (0.344)
ln <i>IssueSize</i>	-0.031 (0.604)	-0.034 (0.563)	-0.034 (0.571)	-0.032 (0.594)
<i>VIX</i>	0.0005 (0.965)	0.002 (0.876)	0.0004 (0.967)	0.001 (0.928)
Year Fixed Effects	Included	Included	Included	Included
Industry Fixed Effects	Included	Included	Included	Included
N	212	212	212	212
Adj. R ²	0.118	0.116	0.110	0.111
F-Stat	1.885***	1.868***	1.813***	1.820***

Notes: This table presents the regression results for the effect of voluntary ICW disclosure in the prospectus and audit quality measures on IPO underpricing. The four models represent the four proxies for audit quality, where (1) is *Inspec*, (2) is *FeeRatio*, (3) is *GC*, and (4) is *IndustrySpecialist*. *ICW * AQ* measures the interaction effect between the voluntary disclosure of ICWs and the audit quality proxy of the respective model. The regression results include industry (two-digit SIC code) and year fixed effects. *p*-values are shown in parentheses. The following continuous variables are winsorized at 1% and 99% levels: *FirmSize*, *Revenue*, *ROA*, *Age*, *IssueSize*. * indicates statistical significance (two-tailed) at $p < 0.1$, ** at $p < 0.05$, and *** at $p < 0.01$.

coefficient for *Extended_Compl*. These results are opposite of the hypothesized effect that adopting this provision increases information asymmetry and underpricing but contradictory indicate that the adoption of the extended transition period reduces underpricing. Moreover, the interaction effect between the extended compliance period and the first audit quality proxy (*Inspec*) is positive and significant at the 10% significance level. This indicates that for firms that adopt the extended compliance period for new or revised accounting rules that are audited by a lower quality auditor, the level of underpricing of their IPO is significantly greater.^{12,13}

Economically, the combined effects of *Extended_Compl* as well as the interaction effect indicate that for a one unit increase in *Extended_Compl*, thus changing from opting out of the extended compliance period to opting in with all else remaining equal, the level of underpricing of a firm's IPO increases by 27.2%. As the mean value of underpricing for the firms in the sample is 23.5%, availing of the provision has a significant effect on the level of underpricing of an EGC firm's IPO. These results are in line with the hypothesized effect that adopting this JOBS Act provision increases information asymmetry. These results, however, only hold for one of the audit quality variable models and are therefore unlikely to result in economically valid results.

With regard to the control variables included in both equations, the results are similar to the first regression equation. For most of the tested models, the coefficient of *Loss* is negative and statistically significant at the 10% significance level. *VC* is statistically significant at the 1% level in first two models of Table 8 and statistically significant at the 5% level in all other models in Tables 7 and 8. The coefficient for *VC* is positive in all instances, indicating that venture capital backed IPOs experience significantly greater levels of underpricing.

4.4 Additional Analysis

The JOBS Act provision allowing EGC firms an exemption from acquiring an auditor attestation on their internal controls is not the first rule exempting firms from this. A specific part of smaller reporting companies, known as “Non-Accelerated Filers”, are exempt from this auditor attestation under the Dodd-Frank Act (SEC, 2010; SEC, 2021). As the firms in the

¹² As *Inspec* is the ratio of deficient audits to the total number of audits checked by the PCAOB, an increase in the value of this variable indicates a lower level of audit quality.

¹³ In general, the reported coefficients and significance levels hold when reperforming the model excluding industry fixed effects. With regard to the main independent variables, only the initially reported statistically significant values for *Extended_Compl* and the interaction effect between *Extended_Compl* and *Inspec* change. The coefficients of these variables are also insignificant in the model excluding outliers.

Table 9: Additional Analysis Accelerated Filers

Panel A: Distribution voluntary ICWs disclosure						
	2016	2017	2018	2019	Total	%
Voluntary disclosure ICW	13	10	20	0	43	35.0%
No disclosure ICW	14	25	41	0	80	65.0%
Total	27	35	61	0	123	100%

	Voluntary disclosure	Observations	%
ICWs remediated		17	39.5%
ICWs not remediated		26	60.5%
Total		43	100%

Panel B: Regression of Voluntary ICW Disclosure and Audit Quality on IPO Underpricing				
Dependent Variable: <i>Underpricing</i>				
	(1)	(2)	(3)	(4)
Intercept	-0.189 (0.803)	0.179 (0.825)	0.379 (0.595)	0.209 (0.770)
<i>ICW</i>	0.493 (0.105)	0.393 (0.383)	0.086 (0.382)	0.086 (0.399)
<i>ICW * AQ</i>	-1.452 (0.163)	-0.350 (0.485)	-0.016 (0.937)	-0.002 (0.992)
<i>Inspec</i>	1.253* (0.072)			
<i>FeeRatio</i>		0.215 (0.539)		
<i>GC</i>			-0.044 (0.744)	
<i>IndustrySpecialist</i>				0.128 (0.298)
Control Variables	Included	Included	Included	Included
Year Fixed Effects	Included	Included	Included	Included
Industry Fixed Effects	Included	Included	Included	Included
N	123	123	123	123
Adj. R ²	0.071	0.042	0.039	0.054
F-Stat	1.331	1.193	1.176	1.250

Notes: Panel A presents the distribution of the sample of firms filing as accelerated filers with the SEC. “Voluntary disclosure ICW” includes both firms reporting remediated ICWs in their prospectus as well as firms reporting that identified ICWs have not been remediated. Panel B presents the regression results for the effect of voluntary ICW disclosure in the prospectus and audit quality measures on IPO underpricing for firms filing as accelerated filers. The four models represent the four proxies for audit quality, where (1) is *Inspec*, (2) is *FeeRatio*, (3) is *GC*, and (4) is *IndustrySpecialist*. *ICW * AQ* measures the interaction effect between the voluntary disclosure of ICWs and the audit quality proxy of the respective model. For brevity the coefficients of the control variables are not included in the table. The regression results include industry (two-digit SIC code) and year fixed effects. *p*-values are shown in parentheses. The following continuous variables are winsorized at 1% and 99% levels from the full dataset: *FirmSize*, *Revenue*, *ROA*, *Age*, *IssueSize*. * indicates statistical significance (two-tailed) at $p < 0.1$, ** at $p < 0.05$, and *** at $p < 0.01$.

sample that have filed their prospectus with the SEC as non-accelerated filer are already exempt from providing this auditor attestation on internal controls, their subsequent disclosure of internal control weaknesses might not have the same effect on underpricing as for firms that would be required to do so had they not been EGC firms.

Table 9 presents the results of the additional analysis. The sample of accelerated filers consists of 123 firms. Panel A shows the distribution of the voluntary disclosure on ICWs. Of the sample, 35% voluntarily disclosed information on ICWs, which is similar to the original sample including both accelerated and non-accelerated filers. Interestingly, almost 40% of companies voluntarily disclosing on ICWs reported that ICWs had been remediated at the time of filing. This is 13 percentage points larger than for the original sample of which 27% reported remediated ICWs.

Table 9, Panel B reports the regression results for the reduced sample of 123 firms under equation (3). For brevity, the separate results for the control variables are not included. Similar to the regression on the original sample, the results show insignificant coefficients for the ICW variable and interaction effects in all four models. The coefficient of *Inspec* is positive and statistically significant at the 10% level. This indicates that for the model including only accelerated filers, a decrease in audit quality leads to higher levels of underpricing.¹⁴ In economic terms, the results indicate that for each one unit increase in *Inspec*, the level of underpricing increases by 125.3%. A one unit increase in *Inspec* is, however, highly unlikely as this would indicate an audit firm performs either no or only deficient audits. On average, the PCAOB inspects 55 audit reports per audit firm per year. For an additional deficient audit (0.018 increase in *Inspec*), the level of underpricing increases by 2.26%. For the average accelerated filer in the sample (with an average issue size of \$188.27 million), this results in an additional \$4.25 million left on the table.

4.5 Implications and Discussion

It is noteworthy that none of the independent variables of interest show a standalone significant effect on *Underpricing*. Many variables even indicate, although insignificant, effects opposite to the predicted direction. There might be various underlying explanations leading to these findings.

First, the results can simply indicate that the hypothesized relationship between audit quality, information asymmetry and IPO underpricing in the specific context of the JOBS Act

¹⁴ The results hold when industry fixed effects are excluded.

does not exist. Prior research indicates that underpricing is significantly greater for EGC IPOs than for non-EGC IPOs and ascribes this result to greater information asymmetry. These results are not in contrast to my research. Similar to prior papers, I find high levels of underpricing for the firms in my sample. The research by Barth et al. (2017) and Westfall and Omer (2018) focuses on the difference in the level of underpricing for EGC firms compared to non-EGC firms. While they do find a significant effect of several post-JOBS Act proxies on IPO underpricing, they only include an audit firm size indicator variable as audit quality proxy.¹⁵ By limiting my sample to firms audited by Big 4 accounting firms and simultaneously using a variety of input and output audit quality proxies, I conduct a more thorough analysis on the effect of audit quality on IPO underpricing. Similar to their research, my proxies for audit quality yield insignificant coefficients. These results therefore indicate that audit quality does not influence the level of underpricing of EGC IPOs.

Second, considering the effect of the different JOBS Act provisions on IPO underpricing, my research is in part different from and in part consistent with prior research. Westfall and Omer (2018) examine the effect of a reduction in the quantity of financial information disclosed in the prospectuses on IPO underpricing. Of the firms in my sample, only two firms provide the regular three years of audited financial statements, and all other firms make use of the reduced disclosure provision. Whereas the effect on underpricing was significant for the firms adopting this provision in the research by Westfall and Omer (2018), my data does not allow for any inferences on this. Barth et al. (2017) on the other hand, conduct an exhaustive research, analyzing the effect of most JOBS Act provisions. In contrast to my research, they only consider whether firms in the sample opt out of SOX 404(b) compliance. Their sample is comparable as it only includes companies not reporting an auditor attestation on internal controls, but they do not include any analysis on ICWs. Apart from the differences between previous research and my research, an important similarity exists. Similar to my research, Barth et al. (2017) also find evidence contradicting the hypothesized effect regarding the availing of the provision to use an extended time period for adoption of new or revised accounting rules. While they note a strong significant effect on underpricing, this evidence is only present in one of the four model variants tested in my research. All in all, the results could indicate that my sample is inherently different from prior research, thereby leading to different findings.

¹⁵ In the research by Barth et al. (2017) as well as the research by Westfall and Omer (2018) a control variable is added to proxy for audit quality. Both papers include a dummy variable indicating one if the audit firm is a Big4 or BigN audit firm.

Another potential explanation for the lack of statistical significance, regarding the audit proxies, could be the lack of validity. Financial reporting quality consists of two aspects: (1) the quality of the financial statements before the audit, (2) the value added through audit quality (DeFond & Zhang, 2014). It is therefore innately difficult to isolate the effect that audit quality has on the underpricing of IPOs. On the one hand, my research might not properly control for the quality of the pre-audited financial statements. On the other hand, the audit quality proxies used might not properly measure the concept of audit quality. For instance, the PCAOB only reviews a very limited sample of the audits conducted by each audit firm in their annual inspection reports. The samples are in part based on perceived riskiness and therefore might present a distorted figure on an audit firm's provided audit quality.

Complementary to the inherent difficulty to isolate the effect of audit quality, my research might suffer from endogeneity concerns. In particular, it is likely that my models suffer from omitted correlated variable bias. If influential variables are missing in the regression models, this likely distorts the coefficient estimates, leading to biased results.

Lastly, the effect of audit quality, certain JOBS Act provisions, or the disclosure of ICWs on IPO underpricing can also have diminished over time. As previously stated, some of the effects that were noticeable in the early years after the JOBS Act was enacted, such as the significant increase in the number of IPOs or opting out of the extended time period for adopting regulatory accounting changes, did not persist over time. The adoption of EGC status may have naturally matured in the capital markets, reducing its riskiness to investors. In addition, Dambra et al. (2015) find that the de-risking provisions were adopted to a much greater extent than the de-burdening provisions. Given that both de-risking provisions have become available to non-EGC firms as well, the difference in filings of EGC firms compared to non-EGC firms is, for a part of the companies in my sample, limited to the opportunity to adopt the de-burdening provisions. As these provisions have now also become available to non-EGC firms, the perceived increased riskiness of EGC firms compared to non-EGC firms may have decreased as a result, thereby reducing the need to rely on higher audit quality to mitigate the risk. The effect on underpricing might therefore be more pronounced in the early years when the de-risking provisions were also only available to EGC firms. To date, only a limited number of papers were published on the effects of the JOBS Act. These limitations also leave room for future research.

5. Conclusion

In this study, I examine the effect of audit quality and the JOBS Act on IPO underpricing. As a result of the JOBS Act, a new type of issuer has entered the equity market: the Emerging Growth Company (EGC). Firms issuing an IPO as EGC may make use of several de-burdening provisions. In this study I specifically consider the effect of the possibility to delay compliance with changes in accounting regulation and the opportunity to avail of the exemption of providing an auditor attestation on internal controls.

The results show no effect of audit quality, proxied by audit deficiencies as per PCAOB firm level inspection reports, the ratio of audit fees to total fees, the issuance of a going concern opinion, and employing an industry specialist auditor, on IPO underpricing in the context of the JOBS Act. For firms voluntarily disclosing ICWs, I also find no statistical effect on the underpricing of EGC IPOs. This effect prolongs when only considering accelerated filers. Regarding EGC firms availing of the extended compliance period, I only find a significant effect in the model using the PCAOB inspection reports as audit quality proxy for the interaction effect between the extended transition period and audit quality. Additionally, I find a significant effect of the extended transition period on underpricing, but the results are opposite of the hypothesized direction.

These results indicate that, overall, higher audit quality does not reduce the greater *ex ante* uncertainty that EGC IPOs are subject to. As the uncertainty is not reduced, the results indicate that audit quality does not influence IPO underpricing. The results are similar for the adoption of the extended transition period and voluntary disclosure on ICWs. While using different proxies for audit quality, the results are consistent with prior research on the JOBS Act.

This thesis contributes to the current literature on the JOBS Act and IPO underpricing in several ways. First, I add to the existing literature on the JOBS Act by providing a more thorough analysis on the effects of audit quality, by including a variety of input and output audit quality indicators. Secondly, I consider a more recent time period. Given that some of the initial effects of the JOBS Act did not prolong, this study adds to the reliability of the existing evidence. For lawmakers and market participants, the results suggest that there are other factors underlying the greater levels of underpricing EGC firms are subject to compared to non-EGC firms.

The results provided are subject to a variety of limitations. As financial reporting quality is the product of the quality of the financial statements before the audit and the value added through audit quality, it is inherently difficult to measure the isolated effect of audit quality.

The audit quality proxies used might therefore be subject to internal validity concerns. Additionally, this study might also be subject to endogeneity concerns. Given the complex nature of the to be measured concept, it is not unlikely that the models suffer from omitted correlated variables.

These caveats suggest potential areas for future research. Most importantly, the results indicate that audit quality does not influence the higher level of underpricing that EGC firms are subject to. A potential area for future research is therefore the consideration of different potentially influential factors on the underpricing of EGC IPOs.

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Appendix A: Variable Definitions

Variable	Definition	Source
<i>Dependent Variable</i>		
<i>Underpricing</i>	The ratio of the closing price of a stock on the IPO day minus the IPO offer price to the IPO offer price.	<i>Audit Analytics and CRSP</i>
<i>Independent Variables</i>		
<i>Inspec</i>	The ratio of deficient audits to the total sample of audits reviewed by the PCAOB per audit firm per financial reporting year, matched to each IPO on last financial year-end before IPO. ¹⁶	<i>PCAOB firm inspection reports¹⁷</i>
<i>FeeRatio</i>	The ratio of audit fees to total fees paid to the IPO firm's public accountant, matched to each IPO on last financial year-end before IPO. ¹⁶	<i>Audit Analytics</i>
<i>GC</i>	Indicator variable equal to one (and zero otherwise) if the last financial year-end before IPO auditor report contained a paragraph casting doubt on the company's ability to continue as a going concern. ¹⁶	<i>Audit Analytics and SEC EDGAR prospectuses</i>
<i>IndustrySpecialist</i>	Indicator variable equal to one (and zero otherwise) if the IPO firm's auditor has more than 30% of annual national market share in the IPO firm's 2-digit SIC code, matched to each IPO on last financial year-end before IPO. ¹⁶	<i>Audit Analytics</i>
<i>ExtendedCompl</i>	Indicator variable equal to one (and zero otherwise) if the IPO firm elects the extended compliance period provision for adopting new or changes in accounting standards in its last publicly filed prospectus.	<i>SEC EDGAR prospectuses</i>
<i>ICW</i>	Indicator variable equal to one (and zero otherwise) if the IPO firm discloses information on ICWs in its last publicly filed prospectus. The value one is assigned if the company specifically states no ICWs have been found, if previously ICWs have been remediated, and if ICWs have not been remediated.	<i>SEC EDGAR prospectuses</i>
<i>Control Variables</i>		
<i>ln FirmSize</i>	The natural logarithm of one plus total assets. ¹⁶	<i>Compustat</i>
<i>ln Revenue</i>	The natural logarithm of one plus total revenue. ¹⁶	<i>Compustat</i>
<i>Loss</i>	Indicator variable equal to one (and zero otherwise) if the firm reported a negative net income. ¹⁶	<i>Compustat</i>
<i>ROA</i>	The ratio of net income to total assets. ¹⁶	<i>Compustat</i>
<i>ln Age</i>	The natural logarithm of one plus the difference in years between the founding of the firm and its IPO date.	<i>Ritter IPO database</i>

¹⁶ The data is based on the last financial year-end before IPO, which is set as the year-end of the last audited financials presented in the last publicly filed prospectus (S-1 or S-1/A form) before each firm's IPO.

¹⁷ Refer to Appendix B and C for information on the collection of this data as well as the collected data.

Variable	Definition	Source
<i>Control Variables (continued)</i>		
<i>VC</i>	Indicator variable equal to one (and zero otherwise) if observation is venture capital or growth capital backed. ¹⁸	<i>Ritter IPO database</i>
<i>Tech</i>	Indicator variable equal to one (and zero otherwise) if the IPO firm's SIC code classifies as a technology industry, based on its 4-digit SIC code.	<i>Loughran & Ritter and Ritter website</i> ¹⁹
<i>ln IssueSize</i>	The natural logarithm of IPO proceeds, calculated by the issued IPO shares multiplied by the offer price.	<i>Audit Analytics</i>
<i>VIX</i>	The VIX value for each IPO at $t - 15$ days, where t is the IPO date of the respective IPO. ²⁰	<i>CBOE Indexes</i>

¹⁸ As specified by Ritter's 2015 paper (Growth Capital-backed IPOs), growth capital is a subcategory of venture capital.

¹⁹ Technology SIC codes have been derived from the paper by Loughran & Ritter (2004) in combination with the most recent update on Ritter's IPO data website (Warrington College of Business). The following 4-digit SIC codes are regarded as technology firms: 3559, 3571 to 3578, 3661 to 3669, 3671 to 3679, 3812, 3823, 3825 to 3829, 3841, 3845, 4812, 4813, 4899, 7371 to 7375, 7378, 7379, and 7389.

²⁰ For IPO observations where no VIX data was available at $t - 15$ days, I use the next available VIX value following $t - 15$ days.

Appendix B: PCAOB Inspection Reports Hand Collection Process

For the collection of data on the number of deficient audit reports per the PCAOB firm inspection reports, I report the collection process for the KPMG report pertaining to 2019. In the data collection, I follow the following steps:

1. On the PCAOB website, I search for all KPMG LLP reports issued for the United States.

The screenshot shows the PCAOB website's search interface. At the top, there is a navigation bar with links for 'About', 'Oversight', 'Resources', and 'News & Events'. Below this, a breadcrumb trail reads 'Home > Oversight > Inspections'. The main heading is 'Firm Inspection Reports'. A search box on the left contains 'KPMG LLP'. To the right, the search results are displayed. The first result is for 'KPMG LLP' with a country of 'United States' and an inspection report date of 'Dec. 17, 2020'. The second result is also for 'KPMG LLP' with a country of 'United States' and an inspection report date of 'Apr. 28, 2020'. Both results include a 'Download PDF' button. The search filters on the left include 'Includes public quality control criticisms?' (Yes (4)), 'International vs. U.S.' (U.S. (17)), and 'Effective Date Year' (2020 (2), 2019 (2), 2016 (1), 2015 (1), 2014 (1), 2013 (1), 2012 (1), 2011 (1), 2010 (1), 2009 (1)).

2. I select the report pertaining to 2019.



3. From the executive summary, I obtain the data on the number of audits reviewed for 2019. I obtain the total number of audits reviewed as well as the number of audits with “Part I.A deficiencies”.

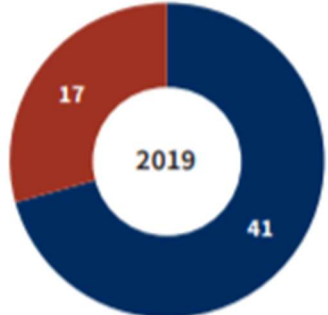
Executive Summary

Our 2019 inspection report on KPMG LLP provides information on our inspection to assess the firm's compliance with Public Company Accounting Oversight Board (“PCAOB”) standards and rules and other applicable regulatory and professional requirements. This executive summary offers a high-level overview of: (1) Part I.A of the report, which discusses deficiencies (“Part I.A deficiencies”) in certain issuer audits that were of such significance that we believe the firm, at the time it issued its audit report(s), had not obtained sufficient appropriate audit evidence to support its opinion on the issuer’s financial statements and/or internal control over financial reporting (“ICFR”), and (2) Part I.B of the report, which discusses deficiencies that do not relate directly to the sufficiency or appropriateness of evidence the firm obtained to support its opinion(s) but nevertheless relate to instances of non-compliance with PCAOB standards or rules.

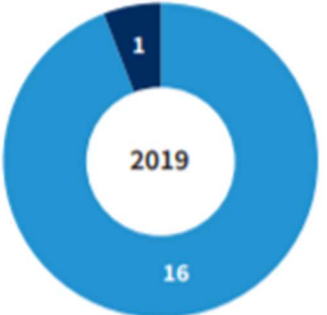
The fact that we have included a deficiency in this report — other than those deficiencies for audits with incorrect opinions on the financial statements and/or ICFR — does not necessarily mean that the issuer’s financial statements are materially misstated or that undisclosed material weaknesses in ICFR exist. If a deficiency is included in Part I.A or Part I.B of this report, it does not necessarily mean that the firm has not addressed the deficiency.

Overview of the 2019 Deficiencies Included in Part I

Seventeen of the 58 issuer audits we reviewed in 2019 are included in Part I.A of this report due to the significance of the deficiencies identified. The identified deficiencies primarily related to the firm's testing of controls over and/or substantive testing of revenue and related accounts and business combinations.



Audit Status	Count
Audits without Part I.A deficiencies	41
Audits with Part I.A deficiencies	17



Deficiency Category	Count
Deficiencies in both financial statement and ICFR audits	16
Deficiencies in the ICFR audit only	1

4. For the KPMG report of 2019, a total of 58 audits have been reviewed by the PCAOB. The PCAOB notes a total of 17 deficient audit reports. The corresponding ratio of deficient audits to the total number of audits for KPMG for 2019 is therefore equal to 0.2931 (= 17 / 58). In analyzing the data, I do not round the ratios but use the numbers are presented in Appendix C.

Appendix C: PCAOB Inspection Reports Data

Year	Deloitte & Touche LLP	Ernst & Young LLP	KPMG LLP	Pricewaterhouse Coopers LLP
2014	0.211538462	0.357142857	0.549019608	0.298245614
2015	0.240740741	0.290909091	0.408163265	0.290909091
2016	0.236363636	0.272727273	0.431372549	0.196428571
2017	0.2	0.309090909	0.5	0.236363636
2018	0.115384615	0.259259259	0.365384615	0.254545455
2019	0.103448276	0.183333333	0.293103448	0.3

Notes: This table presents the manually collected data from the PCAOB annual firm inspection reports. Only for the audit firms in the sample (Big 4 firms) data is collected manually and thus presented in this table. For an explanation on how the data was derived, please refer to Appendix B. The column on the right shows the values for variable *Inspec*. For all of the firms in the sample, the last audited financial statements included in their prospectuses pertain to one of the financial years 2014 to 2019. For the analysis for each of these firms the value for variable *Inspec* is set to the value of the ratio in the table above of their auditor at IPO date, for the financial year of the last audited financial statements included in their prospectus.